

The Angalarri grunter, *Scortum neili* Allen, Larson and Midgley (Teleostei: Terapontidae): description of adults and their habitat

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ABSTRACT

Fourteen mature specimens of the Angalarri grunter (*Scortum neili* Allen, Larson and Midgley) were collected from the main headwater tributary of the Angalarri River in the Victoria River system, Northern Territory, seventeen years after its original discovery at this site in 1981. The distinctive habitat features of this stretch of river include deep (5–6 m), wide (>10 m) pools with closed dense canopy, submerged and exposed fringing tree roots, and an algal-covered substrate mostly comprising pebbles to very large rocks and rock ledges with crevices. *Scortum neili* were common and appear to be confined to this particular river stretch where they were seen in schools of up to twenty-five individuals, often in association with other fishes including Jenkins' grunter (*Hephaestus jenkinsi*). Remains of algae and other vegetation in stomachs together with the size and shape of the gut suggests that this species is primarily a herbivore/detritivore. Counts of fin rays, scales and gill rakers were consistent with the type material except that up to 24 transverse scales below the lateral line were counted on the specimens collected from this survey, compared with a maximum count of 21 in the holotype and paratype specimens. Differences in several proportional measurements between the specimens collected in this survey and the relatively smaller paratypes could be accounted for by ontogenetic growth.

KEYWORDS: Angalarri grunter, *Scortum neili*, Teleostei, Terapontidae, description, habitat.

INTRODUCTION

The Angalarri grunter (*Scortum neili*) is a relatively small terapontid fish, reaching 243 mm standard length. It is uniformly silvery grey with 0–5 randomly distributed black blotches on each side (Fig. 1) and, on freshly captured specimens, about 10 pale vertical bars on each side.

Scortum neili was described on the basis of 10 paratypes from a single location in an upper tributary of the Angalarri River in 1981 (Midgley 1981), and from the holotype, collected from Limestone Gorge, East Baines River in 1986 (Allen *et al.* 1993). Both rivers are in the Victoria River system within the Timor Sea drainage. To date, the species has not been recorded beyond these two rivers.

The entire catchment of the Angalarri River is currently managed by the Department of Defence as part of the Bradshaw Field Training Area (BFTA). During baseline surveys of BFTA, *Scortum neili* was not recorded in the lower reaches of the Angalarri River, or in any of the other waterbodies surveyed at BFTA (Corbett 1997). This paper outlines the results of a survey of the same tributary from which Hamar

Midgley collected the original *Scortum neili* specimens in 1981 (Midgley 1981).

The relatively large size of specimens sampled during this survey provided an opportunity to investigate the influence of body length/age on body proportions, by comparing measurements with the smaller paratype specimens described in Allen *et al.* (1993).

METHODS

Site location, sampling dates and techniques.

Sampling was conducted on 23–24 September 1998 (late dry season) along a stretch of the main headwater tributary of the Angalarri River. The main sampling site was accessed with land vehicles and an assessment of the broad characteristics of the Angalarri River and other BFTA rivers was conducted by helicopter.

The main survey pool (14°59'12"S, 130°55'23"E) of about 1.5 km long was located about 20–25 km downstream from the Angalarri River headwaters in the Barwolla Range (Fig. 2). There were several similar pools in this stretch of river, of which one was Midgley's original collection site (approx. 14°59'S, 130°56'E).



Fig. 1. The Angalarri grunter (*Scortum neili*). Note the dark lateral blotches. Although this photograph was taken soon after capture, the thin light vertical bars have already faded (L. Corbett).

All specimens were captured in gill nets (20 m long, 2 m drop, multi-panelled with mesh sizes 76, 100, 126 and 150 mm), set in various depths for up to one hour in the mid-afternoon. This procedure was conducted to minimise capture of freshwater crocodiles (*Crocodylus johnstoni*) that were attracted to fishes in the net. Crocodiles that were inadvertently captured were released unharmed. Other techniques including seine netting, dip netting, fishing with baited lines and lures, and spotlighting were unsuccessful in capturing or observing *Scortum neili*. A collection of fourteen *Scortum neili* specimens (NTM S.14753-001), as well as voucher specimens of other species captured are currently housed at the Museum and Art Gallery of the Northern Territory.

Habitat characteristics. The habitat of *Scortum neili* was assessed in terms of water quality, stream structure and fringing riparian vegetation.

In situ water quality parameters measured were electrical conductivity, pH, turbidity, dissolved oxygen, and water temperature, using a Horiba (U-10) water quality checker (laboratory calibrated) at two sites along the main survey pool. These parameters were measured at the water subsurface, and over the entire water column (0.5 m intervals from surface to bottom), in order to assess the degree of mixing of the water column. The depth of light penetration was measured with a Secchi disc.

Other qualitative habitat parameters that were estimated included details of stream structure (length,

width, depth), flow and substrate characteristics; degree of shading (% shade at noon); density and composition of riparian and aquatic vegetation; relative abundance of potential food resources (e.g. aquatic invertebrates); and relative abundance of crocodiles (presumed predators).

Diet and anatomical description. The stomach and intestinal tracts (guts) of five *Scortum neili* specimens were examined under a dissecting microscope to assess diet and gut morphology. These specimens comprised large and small individuals that had been held in gill nets for up to one hour. Measurements and counts of anatomical features followed the methodology of Hubbs and Lagler (1970) and the format and terminology used in describing these features followed Vari (1978).

RESULTS

Species present. Thirteen fish species in addition to *Scortum neili* were recorded, including six taxa that were not recorded in Midgley's original survey of this Angalarri River locality (Table 1).

Scortum neili appeared to be common at this site, with over fifty specimens sighted; twenty-seven were captured of which fourteen were retained as voucher specimens. The longest measured specimen was 243 mm SL. However, some individuals observed at close range were clearly larger than fish in the nets, and were estimated as 350–400 mm SL. *Scortum neili* were

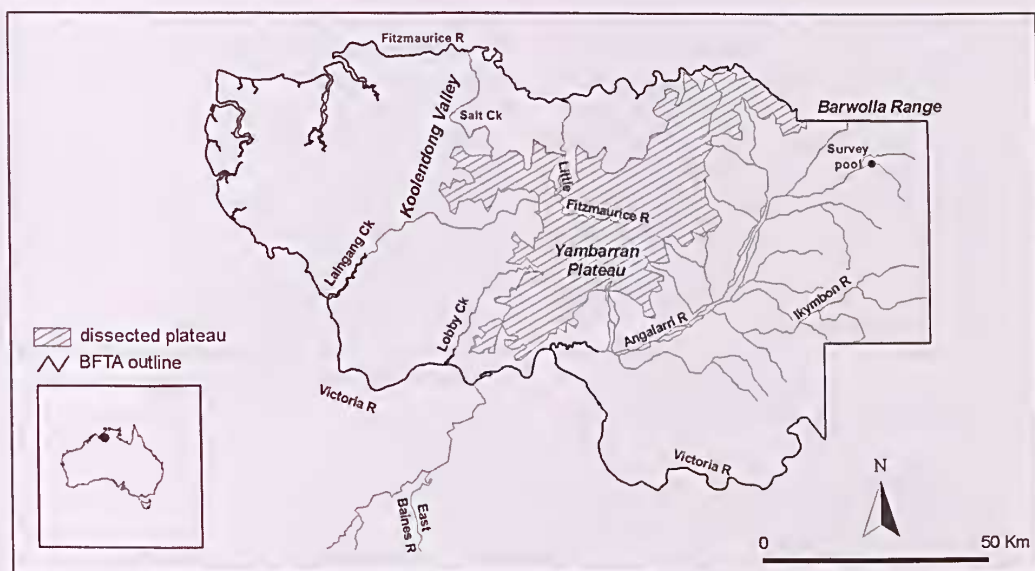


Fig. 2. Bradshaw Field Training Area and location of place names (L. Corbett).

observed singly or in schools of up to twenty-five individuals, which were frequently interspersed with schools of the terapontid *Hephaestus jenkinsi* (Jenkins' grunter). *Scortum neili* was only observed and captured at depths of 2–5+ m and usually amongst undercut banks and tangled roots of submerged riparian vegetation; suggesting that it prefers deeper sheltered habitats during the day.

Habitat characteristics. The Angalarri River is characterised by deep shaded pools within a deep gorge in its upper reach (about 30 km long) before dissipating

into a series of braided channels in its middle reaches that are dry for many months. The river then receives a major tributary (Ikymbon River) to reform in its lower tidal reaches before joining the Victoria River (Fig. 2)

At the sampling site in the upper reach, the river was in a gorge about 25–30 m wide. At the time of sampling the water level was about 10 m below the top of the gorge. The main survey pool was about 1.5 km long with a maximum width of 20 m and a minimum width at the inflow/outflow ends of about 3 m. Depth ranged from about 0.1 m to 5–6 m. No turbulence or flow was detected by eye within the main body of the pool, however minor flow was evident over the shallow rocky extremities of the pool.

Water quality was fairly uniform throughout the depth profile of the main pool, even at depths of 5 m. Turbidity was very low with a turbidity value of 1 NTU (Nephelometric Turbidity Unit) and Secchi disk depths of up to 4.6 m recorded. Electrical conductivity varied little around 41 μScm^{-1} (S = Siemens) and pH was slightly alkaline (7.9–8.2). Water temperature varied no more than 1.5°C across a 5 m depth profile (average 27.8°C). Dissolved oxygen varied with depth more than other variables, with a concentration of 4.35 mg/L at the sub-surface, decreasing steadily to a value of 0.93 mg/L at a depth of 5.0 m.

The stream substrate up to 5 m depth was comprised almost entirely of small pebbles to very large rocks (diameter range about 0.03–>10 m). Substrate composition at depths >5 m was not investigated. Substantial rock ledges and crevices were also present in the main survey pool. The small amount of substrate detritus that was evident was mostly the leaves of overhanging trees, *Pandanus aquaticus* and *Melaleuca*

Table 1. Fish species identified at the site in addition to *Scortum neili*.

Species	Common Name	Number Captured
<i>Megalops cyprinoides</i>	Ox-eye herring	5
<i>Nematalosa erebi</i>	Bony bream	4
<i>Arius graeffei</i> * †	Fork-tailed catfish	55
<i>Neosilurus ater</i>	Black eel-tailed catfish	5
<i>Melanotaenia splendida australis</i>	Red-tailed rainbowfish	37
<i>Ambassis agrammus</i> *	Sailfin glass-perchlet	3
<i>Parambassis gulliveri</i> * †	Giant glass-perchlet	9
<i>Amniataba percoides</i> *	Barred grunter	24
<i>Hephaestus jenkinsi</i> †	Jenkins' grunter	23
<i>Leiopotherapon unicolor</i> †	Spangled grunter	20
<i>Toxotes chatareus</i> †	Common archerfish	16
<i>Liza alata</i> *	Diamond mullet	5
Undetermined species *	Goby	1

* Species not recorded in association with *Scortum neili* on the Angalarri River in the original species description (Allen et al. 1993).

† Voucher specimens deposited in the Museum and Art Gallery of the Northern Territory.

argentea, and there were several dead tree branches. No aquatic macrophytes, other than *Pandanus aquaticus* were recorded in the main survey pool, or at nearby upstream and downstream pools. However, algae formed a thick mat-like layer (up to about 5 mm) on all rocky substrates.

Riparian vegetation, about 5 m wide on both banks, was dominated by *Melaleuca argentea*. Other vegetation included *Ficus racemosa*, *Naucleria orientalis* and *Pandanus aquaticus*. The summation of all riparian vegetation provided a stream shade cover of 35–45% at 12 noon. There were extensive areas of submerged, exposed roots of riparian vegetation along both banks.

Aquatic insects were abundant, especially water

striders (Gerridae) and damselflies (Zygoptera). Freshwater prawns (*Macrobrachium* sp.) and freshwater mussels (*Velesunio* sp.) were common, and twelve freshwater crocodiles were recorded in the main pool.

Diet. The stomach and intestine (gut) contents of five *Scortum neili* specimens were examined. All specimens contained algae, either filamentous algae in sections up to 5 mm long (two guts) or a gelatinous algal mass, possibly partly digested filamentous algae (two guts) or both (one gut). All guts included a relatively small amount of detritus (unidentified vegetation). One stomach included several large *Ficus* fruit and another intestine included a small insect exoskeleton (unidentified species).

Table 2. Comparison of anatomical measurements and counts between specimens collected in this survey and those described in Allen *et al.* (1993).

	Holotype n=1	Paratypes n=10	This survey n=14
Standard Length (SL) mm	220	73.5–86.8	144–243
Measurements in SL:			
Head Length	3.4	2.9–3.1	3.0–3.3
Maximum body depth	2.7	2.8–3.0	2.5–3.0
Dorsal origin to snout	2.7	2.5–2.6	2.6–2.9
Base of dorsal fin	1.8	1.7–1.8	1.6–1.7
Measurements in Head Length:			
Snout length	3.3	3.5–3.8	3.0–3.8
Eye width	5.2	3.5–4.2	4.7–6.1
Interorbital width	3.2	3.1–3.5	2.7–3.0
Maxillary length	3.4	3.3–3.6	3.4–5.0
Longest (5th) dorsal spine	2.5	1.7–2.1	1.8–2.3
Longest (1st–6th) soft dorsal rays	2.2	2.0–2.4	1.9–2.5
Longest (2nd) anal spine	2.0	1.6–1.8	2.1–2.8
Longest (1st or 2nd) soft anal ray	2.0	1.9–2.2	2.2–2.5
Pectoral fin, length	1.4	1.5–1.7	1.5–1.6
Pelvic fin, length	1.3	1.4–1.6	1.3–1.4
Caudal fin, length	1.1	1.2–1.4	1.0–1.2
Min depth caudal peduncle	2.5	2.9–3.2	2.3–2.7
Caudal peduncle, length	1.9	1.7–2.0	1.5–1.9
Counts:			
a) Fins			
Anal rays	III, 9	III, 7–9	III, 7–8
Dorsal rays	XIII, 11	XIII, 9–12	XIII, 10–12
Pectoral rays	16	16–17	15–16
Pelvic rays	1,5	1,5	1,5
b) Scales			
Longitudinal above lateral line	73	62–73	64–72
Tubed lateral–line	52	49–52	49–52
Transverse above lateral–line	10	9–11	10–11
Transverse below lateral–line	20	17–21	21–24
Predorsal scales to occiput	18	18–20	18–21
Sheath scale rows dorsal base	3	1–3	2–3
Sheath scale rows anal base	4	3–4	3–4
Cheek scale rows	5	5–6	4–6
c) Gill Rakers			
Upper/lower limb	13 + 26	11–13 + 25–27	10–13 + 23–26
Total	39	36–40	33–39

All five specimens had long convoluted intestines, about 5–6 times the length of the stomachs. This gut morphology and the mostly vegetative gut contents suggests that *Scortum neili* is basically a herbivore/detritivore, as are other *Scortum* species (Vari 1978).

Anatomical description. Comparisons of morphometrics between the fourteen specimens collected in this survey and the ten specimens described in Allen *et al.* (1993) suggest that several *Scortum neili* anatomical proportions vary according to ontogenetic growth.

Counts of fin rays, scales and gill rakers were generally consistent between specimens in this survey as those for the holotype and paratypes (Table 2). The exception was that up to 24 transverse scales below the lateral line were counted on the specimens collected from this survey, compared with a maximum count of 21 in the holotype and paratype specimens. There were also some notable differences in proportional measurements between the specimens collected in this survey and the relatively smaller paratypes, whereas there was little difference from the similar-sized holotype.

Proportional measurements that were consistently (>50% of specimens) higher in larger specimens included head length, maximum body depth, snout length, caudal fin length and minimum depth of caudal peduncle. Eye width was the only measurement that consistently decreased with increasing body size, with all specimens from this survey having shorter eye widths than the paratypes but not the holotype (Table 2).

DISCUSSION

The distribution of *Scortum neili* in BFTA appears to be limited to the Angalarri River and it may also be confined to the upper main tributary of the Angalarri River. It was not recorded during earlier baseline surveys at sites in the lower reaches of the Angalarri River, the Ikymbon River, Lobby Creek, Lalngang Creek, Salt Creek (North Koolendong Valley), the Little Fitzmaurice River or two unnamed streams on the Yambarran Plateau (Table 3, Corbett 1997, Fig. 2).

Table 3. List of fishes recorded from Bradshaw FTA during baseline surveys (Corbett 1997).

		Angalarri ¹	Koolendong ³	Yambarran ⁴
<i>Megalops cyprinoides</i> (Broussonet)	Ox-eye herring	X	X	X
<i>Nematalosa erebi</i> (Günther)	Bony bream	X	X	X
<i>Scleropages jardinii</i> (Saville-Kent)	Gulf saratoga	X		
<i>Arius graeffei</i> Kner and Steindachner	Fork-tailed catfish	X		
<i>Arius midgleyi</i> Kailola and Pierce	Shovel-nosed fork-tailed catfish	X		
Ariidae	Unidentified fork-tailed catfish		X	X
<i>Neosilurus hyrtlii</i> Steindachner	Yellow-finned eel-tailed catfish	X	X	
<i>Neosilurus ater</i> (Perugia)	Black eel-tailed catfish	X		
Plotosidae	Unidentified eel-tailed catfish			X
<i>Strongylura krefftii</i> (Günther)	Freshwater longtom		X	
<i>Melanotaenia splendida australis</i> (Castelnau)	Red-tailed rainbowfish	X	X	X
<i>Melanotaenia exquisita</i> Allen	Exquisite rainbowfish	X		
<i>Craterocephalus stercusmuscarum</i> (Günther)	Fly-specked hardyhead		X	X
<i>Ambassis agrammus</i> Günther	Sailfin glass-perchlet	X		
<i>Ambassis macleayi</i> (Castelnau)	Macleay's glass-perchlet	X	X	X
<i>Ambassis mulleri</i> Klunzinger	Muller's glass-perchlet			X
<i>Parambassis gulliveri</i> (Castelnau)	Giant glass-perchlet	X ²		
<i>Lates calcarifer</i> (Bloch)	Barramundi	X	X	X
<i>Amniataba percoides</i> (Günther)	Barred grunter		X	
<i>Hephaestus jenkinsi</i> (Whitley)	Jenkins' grunter	X		X
<i>Leiopotherapon unicolor</i> Günther	Spangled grunter	X	X	X
<i>Scortum neili</i> Allen, Larson and Midgley	Angalarri grunter	X ²		
<i>Syncomistes butleri</i> Vari	Butler's grunter	X		
<i>Glossamia aprion</i> (Richardson)	Mouth almighty	X	X	X
<i>Toxotes chatareus</i> (Hamilton-Buchanan)	Seven-spot archerfish	X	X	
<i>Liza alata</i> (Steindachner)	Diamond mullet		X	
<i>Glossogobius</i> n. sp.	Munro's goby	X		
<i>Mogurnda mogurnda</i> (Richardson)	Northern purple-spotted gudgeon			X

¹ Angalarri Valley: lower reaches of the Angalarri River (non-tidal), Ikymbon River

² Angalarri River: upper reach

³ Koolendong Valley: Lobby Creek, Lalngang Creek, Salt Creek

⁴ Yambarran Plateau: Little Fitzmaurice River, unnamed stream (14°59'46"S, 130°27'31"E), unnamed stream (15°13'03"S, 130°25'08"E)



Fig. 3. Aerial view indicating the distinctive features of the upper Angalarri River (L. Corbett).

Scortum neili was common in the surveyed pool and, given the presence of other similar pools, the species is likely to be common throughout the upper reaches of the Angalarri River (Fig. 3). The reason for its apparent confinement in the upper reaches of the Angalarri River is most likely related to the distinctive habitat characteristics there. The large, permanent, deep pools with rocky substrate, continuous canopy (Fig. 4), submerged and exposed fringing tree roots apparently provides suitable microhabitat, food, shelter and possible breeding sites for the species. Despite several ground and aerial surveys, these stream features were rarely recorded elsewhere on BFTA, where deep pools had little overhanging, or submerged, vegetation and stretches of streams with good fringing vegetation were shallow or lacked large rocks on the substrate. However, additional intensive sampling of fishes throughout the Angalarri valley will be required to confirm the distribution of the *Scortum neili* in BFTA.

ACKNOWLEDGMENT

This survey was commissioned by the Department of Defence to determine the current status of the Angalarri grunter at its original collection site and to further describe the major ecological characteristics of its habitat.



Fig. 4. The main survey pool where all Angalarri grunters were captured and stream characteristics measured (L. Corbett).

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Accepted 14 November 2002